**Team Name:** Do or Die – Team 3

**Compelling Question:** How do growing urban areas affect the water quality in surrounding ecosystems?

**Students Researching Claim #1:** Brandon Powell, Lailah Ligons and Joyce Tan

**Claim #1:**

The development of small cities into industrialized cities has caused an increase in malfunctioning sewage and stormwater drainage systems. When these systems malfunction, industrial waste is released into rivers and causes water resources to be polluted by chemical elements.

**Evidence:**

Based on data collected from Falls Lake in Raleigh, NC and Taihu Lake in Suzhou, China and water ecology research conducted by Melissa Riley at UC Berkley, urbanization has the greatest impact on the water quality of an area. Microorganism bioindicators in water, including Oligochaeta, Chironomidae, and Hirudinea, provide support for this claim. Urbanization causes an increase in runoff, which may comprise lawn mower chemicals, household chemicals or fertilizer. Some variables that determine the severity of runoff are elevation, slope and topography. When researching at Falls Lake, construction sites, suspended sediment load (caused by runoff) and timber harvesting were the top 3 contributors to the pollution of Falls Lake tributaries. In Taihu Lake, pollutants enter through runoff that originates from farms and industries. Overtime, nonpoint source pollution, like runoff, causes harmful health effects for humans and living creatures that utilize contaminated water resources.

For more detailed evidence and references, visit <http://bit.ly/1PUuq24>

**Students Researching Claim #2:** Caila Bridges, Ryan Jackson and Uriel Lin

**Claim #2:**

High levels of bacteria and nutrients from runoff pose extreme risks to the public and also to aquatic life.

**Evidence:**

The increase of Industrial and residential waste running into local water sources has caused unprecedented effects to urban ecosystems. In recent years, water sources used for drinking water, recreation and agricultural irrigation have been forced to close because evidence of fecal coliform and other bacteria was found. Consequently, humans can contract fatal diseases and infections from the bacteria present in their drinking water. Millions of people die each year from waterborne diseases; the number of deaths will increase along with the growth of industrial and residential waste in our waterways. Pollutants in water form algal blooms, and these phenomena affect human health and the health of nearby organisms. For example, in 2007, citizens from Suzhou, China were faced with a huge problem in which they could not use fresh water resources because of a blue-green algae bloom in Taihu Lake. The blue-green algae not only created a bad odor, but also seriously affected the lake’s water quality. Algal blooms can also clog fish gills and block sunlight from entering areas of water. If a species in an aquatic habitat dies off, it may affect other species’ ways of life and food intake. Moreover, coming into contact with water affected by algae can cause rashes and respiratory problems for humans.

For more detailed evidence and references, visit <http://bit.ly/1HglXyj>

**Students Researching Claim #3:** Nathan Ress, Idris Ibrahim, Harry Huang and Harini Ratnaharan

**Claim #3:**

If people become aware of the negative impact industrial and residential waste has on their local water sources, change can take place.

**Evidence:**

The origins of nonpoint source pollution are primarily human - whether residential or industrial. Thus, raising societal awareness of how human behavior increases water contamination is essential for working toward a solution. Encouraging friends, family, colleagues and neighbors to reduce the amount of lawn chemicals used that contain pesticides and inorganic fertilizers and to clean up and properly dispose of pet waste are important steps toward curtailing nonpoint source pollution to our waterways. In addition, creating community gardens and compost piles where low-pollution-emitting techniques are demonstrated and cultivated is an important practice to get underway. Painting storm drain markers and drawing public attention to the purpose of these warnings will likely decrease the amount of household waste that is disposed of through these portals. Organizing and advertising community collections of hazardous materials will also alleviate errant dumping of these substances. Greater public awareness and community action to curb nonpoint source pollution can take place through the combined, creative efforts of individuals, communities, government and industry.

For more detailed evidence and references, visit <http://bit.ly/1P9xm9x>